

REMARKS/ARGUMENTS

By the *Office Action* of 17 August 2010, Claims 1 and 4-21 are pending in the Application, and all rejected. Applicant thanks Examiner with appreciation for the careful consideration and examination given to the Application.

Applicant submits this *Response and Amendment* solely to facilitate prosecution. As such, Applicant reserves the right to present new or additional claims in this Application that have similar or broader scope as originally filed. Applicant also reserves the right to present additional claims in a later-filed continuation application that have similar or broader scope as originally filed. Accordingly, any amendment, argument, or claim cancellation presented during prosecution is not to be construed as abandonment or disclaimer of subject matter.

By the present *Response and Amendment*, some of the Claims are clarified, and new Claims 22-27 presented. No new matter is believed presented, and all pending Claims believed allowable.

1. Interview

Applicant very much appreciates the Examiner's indulgence for the 17 November 2010 USPTO interview, and further thanks Examiners Callie Shosho and Patricia Nordmeyer for their attendance. Applicant fully concurs with the Examiner's *Interview Summary* of 22 November 2010.

2. Status of the Claims

The Claims have been clarified to specifically relate to a washable under pad having layers joined by a quantity of adhesive composition from 6 to 40 g/m². Support for the pending Claims can be found in the originally-filed application.

3. Declarations

A *Declaration* is herein provided to illustrate the criticality of the adhesive composition claimed in the current Claims, which range is novel and non-obvious over the cited art. From the testing, it is clear that an under pad with a quantity of applied adhesive composition less than 6 g/m² fails to operate as an effective under pad, and an under pad with a quantity of applied adhesive composition greater than 40 g/m² fails to operate as an effective under pad.

A *Declaration* also is herein provided to illustrate differences between an under pad and a diaper, to those of skill in the art.

4. The Claim Rejections

Claims 1,4-10, 13-15 and 18-21 are rejected under 35 USC 103(a) as allegedly being unpatentable over Hahn et al (US 5306267) in view of Levy (US 5114418) and Tolbert et al (US 2001/0001300) with evidence provided by Gagliardi et al. (US 6245693) and Carlucci et al. (US 2002/0141898) and Peterson (US 5562648).

It is respectfully submitted that the pending Claims are novel and non-obvious over the cited art, as none teach or suggest, alone or in combination, an under pad as claimed in the pending Claims. The *Declarations* provide ample evidence that one of skill in the art would not look to the diaper art to solve problems associated with under pads, and further establish the criticality of the range of adhesive composition from (6 to 40 g/m²) as it relates of relate to an effective washable under pad.

Initially, reusable body-worn diapers and the more generally applicable reusable under pads of the current invention are non-related products. For these reasons, a person skilled in the art would not consider reusable diapers when setting out to find a reusable under pad that outperforms the commercial, quilted under pads.

Reusable cloth diapers are body worn devices for incontinence that are shaped appropriately to conform to the contour of the body. They may be worn by adults, children and babies, which tend to be mobile. Diapers are therefore anatomically designed to snugly fit the body with freedom to move the legs while keeping the diaper firmly affixed around the waste. In terms of comfort, freedom of movement is important. Generally, reusable cloth diapers have a narrow and thick crotch region that is composed of many layers to absorb the urine and fecal spills. It is not uncommon for the spill region to be around at least ½ inch thick or more.

Under pads, on the other hand, are not body worn but instead used as linen protectors. They are flat and typically rectangular in shape. They are used for instance in hospitals, nursing homes and retirement homes, where incontinence may be a problem and/or where linen needs to be protected for other reasons. They have a variety of applications within a healthcare environment above and beyond incontinence. On the other hand, their use is preferably

unnoticed. For this reason they tend to be of similar dimensions (width) as the mattress they are to protect, without affecting the comfort of the mattress. Moreover, for bedridden patients it is important that they absorb any spills that may lead to bed sores (decubitis). Bed sores may be caused by many factors such as: unrelieved pressure; friction; humidity; shearing forces; temperature; age; incontinence and medication; to any part of the body, especially portions over bony or cartilaginous areas such as sacrum, elbows, knees, and ankles.

Further, the claimed recitation of the amount of applied adhesive composition is critical to the success of an under pad. After extensive curing, samples of an under pad with amounts of applied adhesive composition both below and above the claimed range were evaluated for possible use as under pad. The suffered from, among other things, delamination problems and problems concerning water absorption.

For these reasons, it is respectfully submitted that the pending Claims are novel and non-obvious over the cited art.

Hahn discloses a reusable diaper that is comprised of at least a front panel, middle panel, and a back panel. The front panel is comprised of a polyester wicking fabric, cotton, polyester, nylon and the like. The middle panel is an absorbent layer comprised of viscose rayon. The back panel is a liquid impermeable material such as nylon. Alternatively, the front and back panels may be joined by adhesives.

However when discussing joining together the front and back panels, Hahn refers to stitching in a quilting pattern along the dotted lines in Figure 1. Since no further details are disclosed about applying adhesives, it can only be concluded by following the teaching of Hahn that adhesives could at best be applied in the same manner along the dotted lines, which are however positioned solely on the narrow tabs in the corners of the waist area of a diaper. Furthermore, in order to form the multilayer material into the shape of a diaper, simple cutting of the material would not suffice since it would result in delamination of the layers. In order to prevent that from happening, the edge finishing must be employed, as can be seen in the figures of Hahn.

The Examiner cites Levy as a secondary reference and takes position that the present invention is obvious over the combination with Hahn. However it is respectfully submitted that the under pad recited in Claim 1 is patentable over the combination of Hahn and Levy.

Levy discloses a three-layer reusable diaper. The first layer is of terry cloth, a second layer of polyurethane film, and a third layer of woven or knit fabric. The first layer serves as the fluid absorbing portion for the diaper, while the second and third layers form a leakage-preventing portion for it. Both the first and second layers, and the second and third layers, are laminated together with a urethane adhesive. The adhesive can be applied using a cross-hatch, line gravure or dot-roller so as to give a satisfactory level of bond strength and to insure that the resulting laminations remain intact after machine washings. The adhesive is cured using heat for reactivation.

It must be noted that in Levy lamination of layers always involves at least one surface of the barrier (leakage-preventing) layer. Namely, laminating is employed on the interface between the second and third barrier layer, and between the second barrier layer and the first absorption layer. No lamination is suggested or employed between any fluid-permeable and/or fluid absorbing layers, where care should be taken that passage of moisture is not obstructed. Furthermore, the figure of Levy suggests that adhesive is applied as a layer and not in any discontinuous manner. It could even be concluded that applying the adhesive composition in any discontinuous manner, for example in a pattern, and especially in a low quantity of from 6 to 40 g/m² as recited in Claim 1 of the present application would *contravene* the stated purpose of laminating in Levy, which is to secure the bond strength and to insure that the resulting laminations remain intact after machine washings, as stated in column 2, line 31 – 36. Levy thus addresses the problem of bonding strength especially with regard to the barrier layers to provide a reusable washable diaper.

Levy does not address or solve the problem of wrinkling in the uppermost fluid-permeable and/or of fluid-absorbent layer that are in contact with the body of the individual, while retaining unimpeded passage of moisture. If such wrinkling occurs in a multilayered material, for example in an under pad, it can cause discomfort or even harm to an individual whose body is in contact with such an under pad, especially if the passage of moisture is in any way obstructed.

Indeed bedsores and decubitus are a serious problem for hospital patients. Neither Hahn nor Levy provides a solution to this problem. On the other hand, the present invention does address this problem and is therefore a very useful addition to the art.

As stated above, the problem of wrinkling of the under pad while retaining unimpeded passage of moisture, with no subsequent edge finishing or stitching being carried out after cutting of multilayer material, is neither addressed nor solved by Levy.

Consequently, it is respectfully submitted that one of skill in the art would not consider using lamination between any fluid-permeable and/or fluid absorbing layers (since it is not suggested or employed in Levy), in order to preserve unimpeded passage of moisture, with no subsequent edge finishing or stitching being carried out after cutting of multilayer material.

Further, the under pad according to invention is structurally different from the cited prior art in terms of the following distinguishing features

- adhesive composition is applied between **each of** the interfacial areas (i.e., **between each pair of layers**),
- adhesive composition is applied in the form of a **pattern which is sufficiently dense to limit or prevent wrinkling, is sufficiently open to limit or prevent the material from becoming inflexible**
- a **quantity of applied adhesive composition is from 6 to 40 g/m²**.

As a consequence, a washable under pad is provided wherein the layers are joined in such a way that excellent long-time washability is provided without separation of the layers and wherein by suitably selecting the pattern shape of the adhesive composition, it is possible to effectively prevent wrinkling in the plane of the under pad, while retaining unimpeded passage of moisture, with no subsequent edge finishing or stitching being carried out after cutting of under pad, as disclosed in ¶¶ [0021], [0036], [0057] and [0007] of the present application.

As discussed above, the washable under pad according to invention is not obvious. The motivation to combine the above references to prepare the washable under pad according to invention can not be found in either of the references nor in the combination of said references.

Regarding claim 4, the Examiner takes position that Levy discloses that patterning is done “so as to give the satisfactory level of bond strength and to ensure that the resulting laminations remain intact,” and that a skilled person in order to maintain such standards would have designed a pattern that would include a border as presently claimed in Claim 4. The

Examiner further alleges that Gagliardi and Carlucci disclose that forming a border to maintain adhesives is well-known.

However, Gagliardi and Carlucci are concerned with application of continuous lines of adhesive on the edge portions of layers, see element (18) in Gagliardi and (10) in Carlucci. It must be noted that the present invention is actually not about applying the adhesive along the border. The adhesive is applied in each of the interfacial regions in a pattern shape, for instance with a dotted lining pattern that extends over the entire surface of the washable under pad. If a rectangular border is used, then as discussed in the present application, inside the rectangular border there may be carefully selected different pattern parts which are responsible for bonding between the three layers in that region.

However, none of the cited documents taken alone or in combination discloses the application of adhesives between absorbent layers in a pattern, and certainly no border is disclosed as a pattern part, which pattern is sufficiently dense to prevent wrinkling, and which is sufficiently open to prevent the material from becoming inflexible.

The Examiner adds Tolbert to the combination of Hahn in view of Levy in rejecting Claim 8. Tolbert is used as a secondary reference that teaches the use of hot melt moisture curable adhesives.

In the invention according to Tolbert, a molten curable hot melt adhesive is applied to a surface of a textile substrate along a simulated sewing path, whereby an adhesive seam is formed, see ¶ [0070]. Although Tolbert discloses the use of hot melt adhesives, the skilled person would not consider applying the hot melt adhesive in a pattern but as a seam. Even if applying the adhesive in a pattern would be considered, then Tolbert teaches that the adhesive may be applied as a discontinuous bead or pattern so long as the adhesive follows a simulated sewing path, see ¶ [0078]. However, a single seam will not prevent wrinkling of the layers, nor will it prevent separation of the multilayered material when the seam is damaged after cutting the under pad into shape. In other words, Tolbert does not address the serious problem of bedsores and decubitus, which problem has been addressed in the present invention.

Therefore the skilled person would not be motivated to combine the teaching of Tolbert to that of Hahn in view of Levy in order to arrive at the under pad according to invention. Summarizing, cited references alone or taken as a combination do not teach applying adhesive in

a pattern which is sufficiently dense to prevent wrinkling and sufficiently open to prevent material from becoming inflexible while retaining the moisture permeability of the absorbing layers.

Claims 11–12 and 16–17 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Hahn in view of Levy and Tolbert, and further in view of McIntyre (US 4911948). The Examiner cites McIntyre as a reference that teaches screen printing of adhesive material using a roller stencil in order to increase production of the articles containing adhesives on web material. The Examiner takes the position that McIntyre in combination with the primary reference, discloses the present invention. The Examiner notes that McIntyre only discloses the screen printing process onto one layer of material, and the Examiner takes the position that it would be obvious to one with ordinary skill in the art to use a second screen printing section to coat a second layer of material. The motivation to combine the above references is drawn toward the increase in production and uniformity of the adhesive layer as shown by McIntyre.

It must be noted that McIntyre is directed to providing the screen printing method and apparatus obviating the speed and viscosity limitations of the prior art systems, such as heat degradation of coating materials, see column 1, lines 58 - 63. According to column 2, line 8 – 13, the use of screen printing of McIntyre localizes the adhesive deposit to the shape of the label, without adhesive deposit outside of the label. Furthermore, when McIntyre considers incontinent and adult diaper products, it actually only refers to edge finishing by stating that such products require *perimeter* fluid deposits in order to seal all of the respective *edges*, see column 2, line 19 – 24.

Applicant agrees with the Examiner that the prior art is silent about the use of screen printing. As stated in the *Response and Amendment With RCE* dated 11 November 2009, the most important reason that the prior art is silent to the use of screen printing is that it provides for the application of the hot melt adhesive in the form of treadles seams or hems. Using the teaching of McIntyre in this respect has no advantages at all. Indeed, it would be difficult to prepare treadles seams or hems by the method of screen printing. Furthermore, McIntyre does not teach applying adhesive in a pattern which is sufficiently dense to prevent wrinkling and

sufficiently open to prevent material from becoming inflexible while retaining the moisture permeability of the absorbing layers.

It is respectfully reiterated that Hahn in view of Levy and Tolbert does not disclose the currently claimed under pad. Of particular relevance is that the present invention concerns an under pad composed of a moisture permeable top layer, a moisture-absorption element and a moisture impermeable bottom layer. None of these features are known from McIntyre. Indeed, it is questionable whether McIntyre discloses any of the features of the presently-claimed invention, in particular, if it is taken into account that the invention is not merely concerned with the application of a hot melt adhesive, but the application with a particular pattern to prevent wrinkling, while keeping the top layer open. As a secondary reference, McIntyre fails to disclose this feature of the presently claimed invention.

Summarizing, based on the above, it is respectfully submitted that a person of ordinary skill in the art would have no motivation to apply the adhesive deposition disclosed by Levy into the laminate of Hahn. Most importantly, the diaper of Levy is of a totally different concept from the diaper of Hahn. Hahn has to consider the permeability of the top layer material whereas Levy has not. However, even if one of ordinary skill were motivated to apply the adhesive deposition disclosed by Levy into the laminate of Hahn, then the essential feature of doing so in a particular pattern that is sufficiently dense to prevent wrinkling, while sufficient open to allow unimpeded passage of moisture, is not disclosed at all.

It may be true that Levy discloses the use of dots, cross-hatching and/or lines to allow for bond strength and lamination washability, but Levy does not consider patterns that prevent the passage of moisture from the top layer material to the absorption element from being impeded.

In conclusion, the Applicant agrees that a single disclosure containing all the presently claimed elements does not exist. The prior art discloses diapers and fabrics with threadless seams and hems. Yet, none of the prior art references disclose using a pattern such that wrinkling is prevented as well as delamination when the under pad is cut or trimmed, while guaranteeing the unimpeded passage of moisture. McIntyre is silent on this feature and provides no specific teaching in respect of this feature.

It is thus respectfully submitted that Claims 1 and 4-27 are patentable over all the cited references.

5. Fees

This *Response and Amendment* is being filed within four months of the *Office Action*, thus a one month extension of time fee is believed due.

This *Response and Amendment* is accompanied with the RCE fee due.

Claim fees are believed due for twenty-five total Claims.

Applicant authorizes the Commissioner to charge deposit account No. 20-1507 for any further fees deemed due.

CONCLUSION

By the present *Response and Amendment*, this Application has been placed in full condition for allowance. Accordingly, Applicant respectfully requests early and favorable action. Should the Examiner have any further questions or reservations, the Examiner is invited to telephone the undersigned Attorney at 404.885.2773.

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